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HON. A. KELSO ROBERTS, Q.C., MINISTER F.A. MACDOUGALL, DEPUTY MINISTER

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THE COVER

The Swampy Cree Indians of the Hudson Bay Lowlands are dependent to a considerable degree on the use of wild geese for food. Our photo by Harold C. Hanson shows the final stage of the processing involving the cleaning and boiling down of the entrails with their attendant load of fat. (See Report by Harold C. Hanson and Andrew Gagnon). Back cover photo by Ted Jenkins: The end of a successful day in Quetico Provincial Park.

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THE QUESTION OF ANGLING SUCCESS

It is estimated that there are approximately 1.5 million resident anglers in Ontario and that this number is increased by some 400,000 non-resident anglers each year. These, then, are the people that utilize our game fish resource. How successful or how efficient is their effort? Questions such as these pose pressing problems for which there is no immediate solution.

Many people equate "luck" with angling success and while it is agreed that good fortune or chance does play an important role at times, it is pretty well limited to "being in the right place at the right time". From here on, angling success depends almost entirely on skill.

Fisheries workers have shown in several studies via the creel census technique that approximately 80 per cent of the fish caught are harvested by 20 per cent of the total number of anglers. Furthermore, it is also known that the majority of the successful anglers are the most competent fishermen – people skilled with a good knowledge of the fish, their habits and their respective environments and the fishing techniques commonly used in the successful harvest of each.

It is quite evident, therefore, that the practice of sport fishing is an art and not something that can be readily acquired without considerable effort. Proficiency in the use of angling gear is a prerequisite and the remainder of the artistry can only be acquired through study and experience. Even the skilled angler of yester-year cannot afford to rest on his laurels. Water areas, climatic conditions and fish populations are continually in a state of flux, and an angler, to be successful, must be aware of such changes and must adjust his methods accordingly.

"Gone Fishing" has become a very hackneyed expression, and we suspect that the term is being used to cover a multitude of recreational activities generally associated with cottages, boats and water. There is no objection to this providing that these pseudo-anglers are not too vociferous in their complaints about poor angling success. Good fishing success is experienced in all parts of Ontario but, unfortunately, too often by too few.

THE HUNTING AND UTILIZATION OF WILD GEESE BY THE INDIANS OF THE HUDSON BAY LOWLANDS OF NORTHERN ONTARIO

by Harold C. Hanson[1] and Andrew Gagnon[2]
(Photos by Harold C. Hanson)

The cultures of many native peoples have often centred around the intensive use of a single species of wildlife or group of closely related species. The dependence of the coastal dwelling Eskimos on seals, the inland or Caribou Eskimos on caribou and, in the past, the plain's Indians on buffalo is common knowledge, but less well known has been the extent of the dependence of the Swampy Cree Indians of the Hudson Bay Lowlands–particularly the coastal dwelling groups–on wild geese. For no other group of North American Indians has the kill of waterfowl assumed a similar degree of importance.

Wild geese are highly migratory, and the privilege of hunting them is highly sought and competitive both at the individual level and at the state and provincial level. While all findings to date have indicated that the annual kill made by the Indians has not been the important factor affecting the population of Canada geese from year to year, it is pertinent to know how and under what circumstances the kill is made and whether the resource is fully and wisely used.

Most of the present information was gained by the authors during the course of three springs spent with Indian groups whose primary objective at this time was the hunting of geese–Hanson at Hawley Lake and along the Sutton River near Hudson Bay in 1959, and Gagnon at Nattabisha Point at the south end of James Bay in 1962 and 1963. Additional background information has been gained by Hanson during frequent trips to the region since 1946 and by Gagnon as a resident wildlife officer at Moosonee since 1956.

Our findings were made possible by the co-operation and hospitality of the Indian families with whom we lived: at Hawley Lake, Joseph and Louis Chokomolin; at Nattabisha Point, Thomas Archibald, Alex and Stan Katebeltic, and John, Mark, George and Edward Butterfly, and Arthur Allisappi, Oliver Small, Ray Echum, Emile Sackaney, James Blacknet, Hubert Essau and George Sutherland.

The Hudson Bay Lowlands comprise an area of 125,000 square miles, extending from the Churchill area of Manitoba to the south end of James Bay. Most of it is underlain with the sedimentary rocks of the Paleozoic Basin and characterized by its extreme flatness. Almost the entire region can be described as a vast area of alternating muskegs and subarctic forests although there are large tracts of comparatively dry country and other tracts in which water in the form of ponds and lakes covers a very high percentage of the land. The area is bordered by extensive coastal salt-water marshes, the feeding grounds each spring and autumn for several hundreds of thousands of blue and snow geese en route to and from their breeding grounds. It is the interior areas of lakes and

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Canada goose decoys made from a log and burnt stick at Hawley Lake.

ponds which support over 300,000 Canada geese during the breeding season.

Beaver, muskrats and rabbits have been the mainstay mammals in the diet of the Indians over the centuries. Recently, however, the northward extension of the range and increase in the numbers of moose have made a substantial contribution to the food resource of the country. Woodland caribou are comparatively common in the northern sector of the Ontario portion of the Lowlands and are an important part of the diet of the Indians in whose trapping grounds they occur.

Wild geese have always constituted a significant part of the wildlife food resources of the Indians of the Hudson-James Bay region, and a basic, unwritten premise of the International Waterfowl Treaty has been that the Treaty Indians and the Eskimos of the far North who are living off the land may take waterfowl when in need of food. In early historic times, the arrival of geese sometimes meant the release from starvation; always, they have been of importance to the health and welfare of these people. After a long, harsh and trying winter, not infrequently interspersed with periods of limited food supplies, the return of the first wild geese in spring is the cause of great excitement in the encampments and villages of the North. Better days are again at hand.

Barnston, an early observer in the Hudson Bay area, has well expressed the satisfactions to the Indians of a successful hunt. "When the long and dreary winter has fully expended itself, and the willow grouse – have taken their departure for more northern regions, there is frequently a period of dread starvation to many of the natives, who are generally at that time moving from their wintering grounds to the trading posts. The first note, therefore, of the large gray or Canada goose – is listened to with a rapture known only to those who have endured great privation and gnawing hunger. The melancholy visages brighten, and the tents are filled

A goose blind being built from stranded ice floes on the Sutton River.

with hope, to which joy soon succeeds, as the happy father, or the hopeful son and brothers, returning successful from the hunt, throws down with satisfaction and pride the grateful load."

No "outsider" is likely to express the meaning of the wild goose to the northern Indian as poignantly and effectively as the late Bishop Robert J. Renison who was a missionary at Fort Albany, Ontario, near the turn of the century. A funeral service had just been held at the small church and the mourners, cold, sick, discouraged, and hungry after a long winter, were moving on snowshoes toward the cemetery (Renison, 1944).

"The Missionary walked in front, treading warily among the tents where husky dogs prowled, on his way to the little grave yard where two men with pickaxes had been for hours chipping the frozen earth deep enough to make a shallow trench. Although in the morning the whole scene looked and felt like the ragged end of winter, now the South wind grows warmer every moment and already the haze is seen in quivering waves over the melting ice and snow.

"As the cortege was lost in the maze of wigwams, suddenly the cry of wild geese was heard. The funeral procession stood still and from all over the settlement came the answering call from every living soul. A great flock of Canada grey geese swept like a gigantic airplane over the trees rejoicing at what seemed a welcoming call. The phalanx turned to leeward and sailed slowly down over the spot from which the sounds came. It was too much even for sorrow and decorum. The Chief Mourner dived into his tent and appeared in a moment with his loaded gun. With incredible ease and grace he brought down a goose with each barrel. Cheers and laughter rang out. The oldest instinct of man triumphed in every simple

Setting out goose decoys in the shallow waters of the Sutton River.

A morning's kill of Canada geese along the Sutton River.

The rapid method of field dressing geese used by northern Indians. A patch of feathers is plucked from the belly; the intestines are pulled out and severed; and the blood is removed with a swatch of grass. The opening is sutured and closed with a tail feather.

heart and as the pallbearers patted the bereaved husband on the back, he modestly replied like a true sportsman, 'She did it. I always had luck when she was with me.' Then the spell was broken; the procession resumed its direction."

More recently, a fictionalized version of the intertwining lives of geese and Indians has been written with great effectiveness by Fred Bodsworth in his novel "The Strange One". For a portrayal of the lives of the Indians of the muskeg of northern Ontario on a broad canvas, the reader is referred to this story.

The Canada goose, which seems almost domesticated in its tameness and adaptation to refuge conditions during the winter in the south, again resumes its traditional role as one of the wildest of birds on its return to the north. With the northern Indian, it meets a worthy adversary, and the battle of wits that ensues in a hunt and the stratagems used by the Indian hunter are always a delight to witness.

Patience, inspired improvisations of blinds, crude but effective decoys, skilled calling and unerring marksmanship are the ingredients that weight the contest in favor of the Indian. The rivers of the region are the highways of travel for both the migrant goose and the Indian on his trapline. In spring, before breakup, blinds are made on the river ice or along the shore line. On the coastal marshes, they may be made along the willow line or as much as one-half mile out on the ice of James Bay. Snow or ice are often used in their construction, or, in some cases, spruce trees and brush. For warmth and comfort they are built with spruce boughs or grasses. If the river is open and shallow, the decoys may be set out in midstream, the hunter hiding nearby in a blind made from grounded river ice.

Calling, an art practised from childhood on the least provocation, brings the geese within range and the killing is clean. Loss of geese from crippling under these circumstances is almost zero. The penetrating, damp spring cold near Hudson Bay may make it expedient for the hunter to pursue a constant beat back and forth near his blind to keep warm but, by the time the distantly sighted northward bound geese are assuming recognizable form, he is well hidden. If the arriving geese are a pair, invariably both are dropped in quick succession.

From the standpoint of the resource, the principal concern is only whether or not the kill by the northern Indian does not exceed what the population can withstand. Since 1945, the Indian hunters residing in the lowlands have been interviewed regarding their kill of Canada geese (Hanson and Smith, 1950; Hanson and Currie, 1957). Weather was an important factor influencing the size of the kill. If the breakup period in spring was prolonged, the kill was considerably higher. If breakup was early and relatively swift, the geese migrated with few stops directly to their nesting areas, and the kill was lower. Under either circumstance, the period of time the geese are available to the Indians at their trapping camps along the rivers is brief, and the size of the kill is more dependent on this factor than on the size of the population. As soon as the thaw sets in and the inland muskeg nesting areas begin to become free of snow, Canada geese leave the rivers and are no longer available to the Indians who must trap the watercourses and find travel over the inland muskeg at this time extremely difficult.

Kills made by single hunters vary greatly from as many as 40 or 50 to zero depending where in the range hunting takes place. Indians located in the better sectors of the range average from

Plucking Canada geese in a tepee at Hawley Lake.

10 to 20 Canada geese per year (Hanson and Currie, 1957). When an unusually large kill is made by a few Indians, it is shared with the entire encampment.

The hourly rate of kill varies widely with locality and season. Our data on hunting at Nattabisha Point illustrates this. In the spring of 1962, from April 11 to May 8, eleven hunters, representing seven families totalling 30 people, shot 468 Canada geese.

In the spring of 1963, these same Indians had a discouraging hunt due to a warm spring. Between April 14 and May 4, 14 hunters spent a total of 1,140 hours in their blinds and killed only 221 Canada geese.

When a single Indian hunter bags as many as 17 geese in a half day, the impression is one of excessive kill but, as indicated earlier, the only important consideration is whether or not the overall harvest is excessive and that no appreciable waste occurs. It should be remembered that a successful hunt entails considerable individual initiative and effort. The hunters from the encampment at Nattabisha Point hunt over a 20-mile stretch of coast line. Dog teams are used for transportation and the hunter may be gone for a period of two or three days.

Are the kills made by Indians residing on the breeding grounds of Can-

With food abundant, the spring hunt is a happy time, reflected in the faces of all.

ada geese in northern Ontario excessive? They can scarcely be regarded so in view of the fact that they constituted approximately 4.6, 2.6 and 3.7 per cent, respectively, of the Mississippi Valley Flyway population from 1954-1956. In contrast, the present-day quota system for regulating kills of Canada geese in Wisconsin and Illinois is predicated on an allowable combined kill of not over 20 per cent of the predicted flyway population. This latter figure is too high in years of low production, but, in such instances, a compensating adjustment in the quota is set for the following year.

(The autumn kill of geese in northern Ontario consists mostly of blue and snow geese. The annual kill by approximately 275 hunters residing in summer at the coastal ports of Moosonee, Moose Factory, Fort Albany, Attawapiskat, Winisk and Fort Severn is around 30,000 to 38,000 or six to eight per cent of the Flyway population.)

The traditional example of efficient and total use of an animal has been the proverbial pig in the Chicago stockyards of which it is said only the squeal escapes being incorporated into some product. Surely, the northern Indian is as wholly devoted in getting his shotgun shells' worth out of each goose, and it might be said that not even the "honk"

Snow goose meat being dried and smoked at Fort Severn. A freshly killed goose is being barbecued for immediate use.

is lost, as it is engraved on the mind of the youngest child to be later used in calling other geese into the family larder.

Preservation of the product is always the first concern. If the weather is warm and the geese are not to be eaten nearby in a few hours, spoilage is forstalled by a quick and ingenious means. A swath of feathers is plucked from the belly area as soon as the goose is retrieved, a slit made in the skin and the intestines pulled through in the crook of one finger. These are freed with two deft strokes of the pocket knife and the opening quickly closed again, using a tail feather both as needle and suture.

The first by-product is, of course, the feathers. The plucking process creates an indoor "snowfall", which in a small tepee may have its comical effects, but the feathers used in sleeping robes mean survival in a basically harsh environment. These robes receive scrupulous care and are hung out-of-doors each day after use to retain their warmth and buoyancy.

After plucking, the neck with head, the wings and the legs are first removed from the carcass along with the viscera that remain. The meat is then removed from the body skeleton by an ingenious cutting operation that requires only a few deft strokes. In this procedure, which requires less than a minute, the large flight muscles are first cut free from the breast bone, removed with the fleshy parts of the legs and the upper portions of the wings. This entire mass is then freed from the body skeleton. If immediate consumption is desired, these most edible portions of the carcass may be simply barbecued; if desired for later use, they are hung on poles in a tepee and dried and smoked over a willow fire for about 10 days. Preserved in this manner, the goose is called "nahmasteak". The body skeletons and adhearing flesh are also dried and smoked for later use in soups.

The first sizeable kill made in spring may be a signal for a feast by all. On these occasions, the entire carcass is roasted by suspending it over the fire by a string and then rotating it slowly for about an hour and a half. Goose prepared in this manner is called "sakabonn". The fat that drips from the carcass is collected and saved for use in summer. It is much preferred to butter.

The feet and wings may be cured in the same manner, to be used in summer in soups or boiled for immediate consumption. The heads with necks attached are boiled or roasted. On one day, only the wings may be eaten; on another, only the heads and necks are used.

The viscera do not go unused. The gizzards are opened and cleaned and cured in the same manner as the body musculature. Livers are fried or boiled. The hearts are usually put on a stick and cooked over an open fire. Prepared in this manner, they are called "ahbonn". The blood is used in stews or mixed with bannock or rolled oats for dressings. The blood and lungs may also be used in blood pudding made by boiling with rolled oats to form a thick broth which is called "apanaboue".

The final stage of the processing involves the cleaning and boiling down of the entrails with their attendant load of fat. The fat laden liquor is then stored in the parchment-like bladder of a moose or in a can. The tripe is eaten boiled or with bannock and tea for lunch.

To the uninitiated, it may be disconcerting to see a dozen goose heads peering out of a cooking-pot and the more so when it is realized that the brains and even the eyes are eaten, but herein lies the "secret" of health of northern natives, for it is in his consumption of the total animal (including, in the case of some animals, the stomach contents) that a complete and nourishing diet is assured. Considering the circumstances of their lives and the complete use they make of geese, who would deny the self-reliant Indians their share of the kill?

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SOME FRINGE BENEFITS OF ANGLING

by J.C. Weir
Biologist, Southern Research Station, Maple

So you went fishing and caught nothing! Was the day a complete loss? If so, perhaps there is something in this article that may help you on the next trip. Many reasons or excuses for going fishing are available but none are necessary. Everyone understands the expression "gone fishing". Even your wife will understand your desire but --- let us suppose that you do get away on a fishing trip. What are you going to do in the great outdoors and what will you find to interest you?

If you are content to rest or sleep -- read no further! If you are satisfied to still fish or troll and find these methods successful and relaxing -- more power to you! But if your usual angling activity and success bores you to tears, and if you are seriously considering giving up the manly art although you know you should and would like to enjoy angling, then perhaps the following ideas will help.

To enjoy angling to the full, one must put a lot into it. This can take two forms: skill in the use of angling equipment or practice in the enjoyment of nature and the world about. Mastery of the first will enable you to become a skilled angler; proficiency in the second will open the door to the fascinating world of nature. Obviously, a combination of both is desirable.

If you wish to become an active angler, as opposed to the passive breed, you will need to master the mechanics of handling the fly, spinning or bait casting rod. Proficiency has been achieved when you suddenly realize that you are experiencing a good deal of pleasure and satisfaction from the exercise of your skill in simply casting a lure. This is akin to that experienced by a skilled rifleman when target shooting.

The next step is to acquire similar proficiency under more difficult conditions such as will be found in the field. An abundance of natural targets on the water and plenty of obstacles on the course will test your skill and patience to the core, but cheer up --- you will soon be ready to begin fishing! By now you will have begun to "read" water, to visualize and understand what goes on under the surface. You will gradually learn to fish the best places in a skilful manner and, when you have experienced your first success at "calling your shot" and have the fish to prove it, you are well on your way to becoming the complete angler. Certainly, it took some effort but you are now well above the masses in which mediocrity, boredom and dissatisfaction reign supreme!

Perhaps you have already sensed that a good deal of active angling can be done automatically or without much conscious thought and deliberation. This is the key to successful angling and can be attained by all who seek it. Such a faculty enables anglers to enjoy their sport for lengthy periods without a sense of boredom, fatigue or dissatisfaction by permitting them to concentrate on the various aspects of nature when the fish are not biting. The company of good companions can also be enjoyed, but conversation should be kept to a minimum and carried on in low tones. The presence of one obnoxious character can spoil the day for everyone.

So, now we have you fishing mech-

anically. Lures are flipped out with ease and accuracy; retrieves are made while looking for the next place to cast, and yet, each retrieve is "fished" right to the rod tip and all the tantalizing changes of pace are employed. The only time you need to pay particular attention to what you are doing is when a fish rises, splashes or strikes. Now the question --- what to do with your spare time?

Here, the second phase --- that of observing nature --- takes over. The active angler has the original roving eye. He is constantly scanning the air, water, forest, marsh or grass for signs of movement which will denote that some creature of nature is present. The splashing whirl of a startled muskie, the wedge-like ripple of a swimming muskrat, the sneaking form of a bittern in the marsh grasses, the hovering of a kingfisher over a school of minnows, the aerial plunge of a wood duck into her nest in a hollow tree, or the startled erratic flight of a woodcock from amid the alders, are all activities of nature that delight the observant angler.

And what about the water in which you fish? Is it simply wet? Look again! Do you see the water striders and the swarms of whirligig beetles on the surface? Is that mass of water-soaked vegetation simply weeds or does it contain a myriad of individual aquatic plants, some quite interesting and all serving a useful purpose in nature. Perhaps you will learn to identify the more common ones and those that are particularly beneficial to fish and wildlife by providing food or cover or both. You may notice green and brown powder-like flecks near the surface of the water. These are tiny forms of animal and plant life that go to make up the vast plankton population in our more fertile waters. Many are microscopic in size and most are quite attractive in colour and design when viewed under magnification. Many forms of plant plankton are eaten by animal plankton which are in turn eaten by most young species of fish. Plankton has a very fishy odour and it

Fly fishing in the Eltrut River, Fort Frances District. Photo by T. Jenkins.

Water smartweed, common along stream and lake margins. Photo by H.K. Campbell.

is from this source that fish actually derive their "fishy" odour. Sounds fishy, doesn't it?

If you are observant, you may notice what at first appears to be patches of brown powder near the surface in sheltered areas around docks or logs. However, closer observation will reveal that this patch of brown powder is actually made up of thousands of tiny animal plankton forms and that they are almost continually in motion --- a peculiar jerky dancing motion. These are the water fleas or daphnia. They are quite visible to the naked eye and are a favourite food of young fish and of some older ones. It is fascinating to watch a large carp devouring water fleas near the surface. A small whirlpool is created by the carp's sucking mouth, and streams of the tiny creatures are caught up in the current and sucked down into the abyss.

In seeking out the various fish species, anglers will invariably find themselves in different types of habitat and each will have something unique to offer to the angler-naturalist. The muskie, pike or largemouth bass enthusiast will invariably find himself in or near marshy areas where an abundance of wildlife is to be found. Observations on wild ducks, muskrats, aquatic plants and the numerous marsh dwellers such as grebe (helldivers), marsh wrens, coots, rails, snipe, bittems, blue herons, bullfrogs, snakes and turtles will tend to keep him busy in conjunction with fishing.

The stream fisherman will have plenty of opportunity to examine the banks for wild flowers, ferns and shrubs and to inspect each sand or mud flat for tracks of coon, mink, porcupine, deer, bear, wading birds and many other forms of wildlife. He will have many opportunities to observe and identify song birds at close range and to watch with fascination a hatch of aquatic insects emerging from the waters of a quiet pool in late evening.

Those who fish the relatively inaccessible areas are in an entirely different world. Here, most forms of wildlife will show little fear of man and it is almost impossible for the angler-naturalist to have a dull day. Deer, moose, bear and their young are often seen along the waterways; foxes and coons may be observed catching and playing with frogs among the fallen trees on the lake shore; the osprey (fish hawk) or a family of loons, mink or otter may show you how to catch fish without the use of expensive tackle; several species of wild orchids and other specialized plants may be found growing in the damp, quaking bogs around ponds, and the work of beaver will be evident along practically all water courses. Various species of song birds may be observed or heard around lakes and ponds in our larger

The great blue heron stands sentinel-like along the shallows. Photo by L.J. Stock.

forested areas, and many different types of foliage may inspire you to dig deeper into the field of botany.

Many trips afield by the angler are dull and uneventful simply because the fish did not co-operate and the angler did not take advantage of all that nature had to offer. Far too many of us "look but do not see"! Let us not be satisfied to simply identify an object in nature as a tree, flower, bird, fish, weed or similar title. It would be much more interesting if we could identify at least the more common species in each group; if we could learn what is rather rare or hard to find, and where to look for them; or if each of us could develop a special interest in even one phase of nature lore which would be an alternate point of interest when fishing becomes dull. And who knows --- perhaps we might even catch more fish by this method! The pesky critters have the habit of striking when we least expect it!

Now, don't tell us that you have just returned from a fishing trip --- and nothing happened!

A PHOTO STORY
POLAR BEARS ON THE HUDSON BAY COAST

by G. Kolenosky, Biologist, and R.O. Standfield, Wildlife Supervisor, Research Branch, Maple

The polar bear, one of the largest mammals inhabiting the Arctic regions, has long been an enigma to scientists and laymen alike. In spite of its large size and the many historical accounts of contact with the animal, very little is known about the population numbers, distribution, food habits and behavior of the species. It had long been known, however, that polar bears, which spend the winter months hunting

Plate 1. The shores of Hudson Bay are low, flat and uninhabited except by travelling Cree Indians. Sandy beaches and broad tide flats are characteristic. Vegetation, predominantly clumps of grasses and sedges, is sparse and scattered. Numerous shoals and islands are found near Cape Henrietta Maria which separates Hudson Bay from James Bay.

seals on the ice of Hudson Bay, come ashore during the summer. In order to estimate the number and distribution of this population in Ontario, biologists of the Department of Lands and Forests conducted an aerial census from Moosonee (on the south end of James Bay) to the islands in Hudson Bay near the Ontario-Manitoba border during the summer of 1963.

The population inhabiting the coast of Ontario in August was estimated to number 70; most of these were concentrated along the Hudson Bay shore. This figure does not include bears which may have wandered considerable distances inland or those which had remained in the open sea. Plates 8 and 10 were taken by D. H. Johnston during a faunal survey of the coast in the summer of 1961; all others were taken by the authors during the aerial survey of 1963.

Plate 2. Polar bears show definite preferences for certain localities—usually those which have sandy beach ridges. Particularly attractive sites are small islands and shoals. Concentrations such as this are unusual although there is evidence that this island has been frequented by bears for many years. Pits, dug by bears as resting sites, are apparent as depressions in the ridges. Many are old and completely overgrown by vegetation.

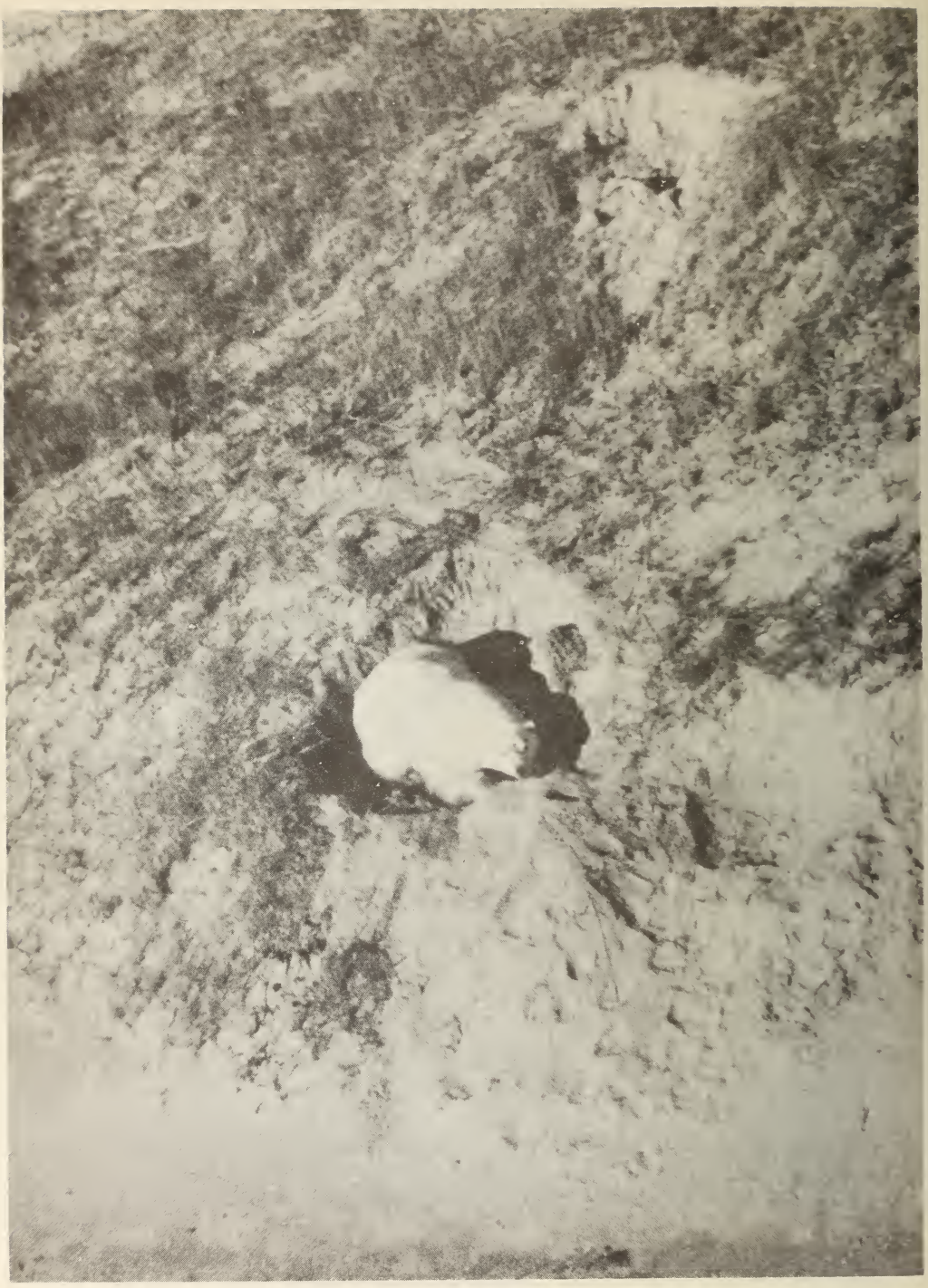

Plate 3. The purpose of "resting pits", which are usually dug in sand ridges, is as yet unknown. Three pits are evident in the photo and all may have been dug by this large adult.

Plate 4. Bears or their tracks were found along most parts of the coast. Stony beaches and clay tideflats, although not used as resting areas, frequently served as travelways.

Plate 5. Tracks, which are easily identified from the air, provide evidence of a bear's presence and the direction of his travels. Fresh tracks, such as those in the foreground, are readily distinguishable from older ones. Except where they are washed by tides, tracks may persist for long periods and serve as useful indicators of polar bear activity.

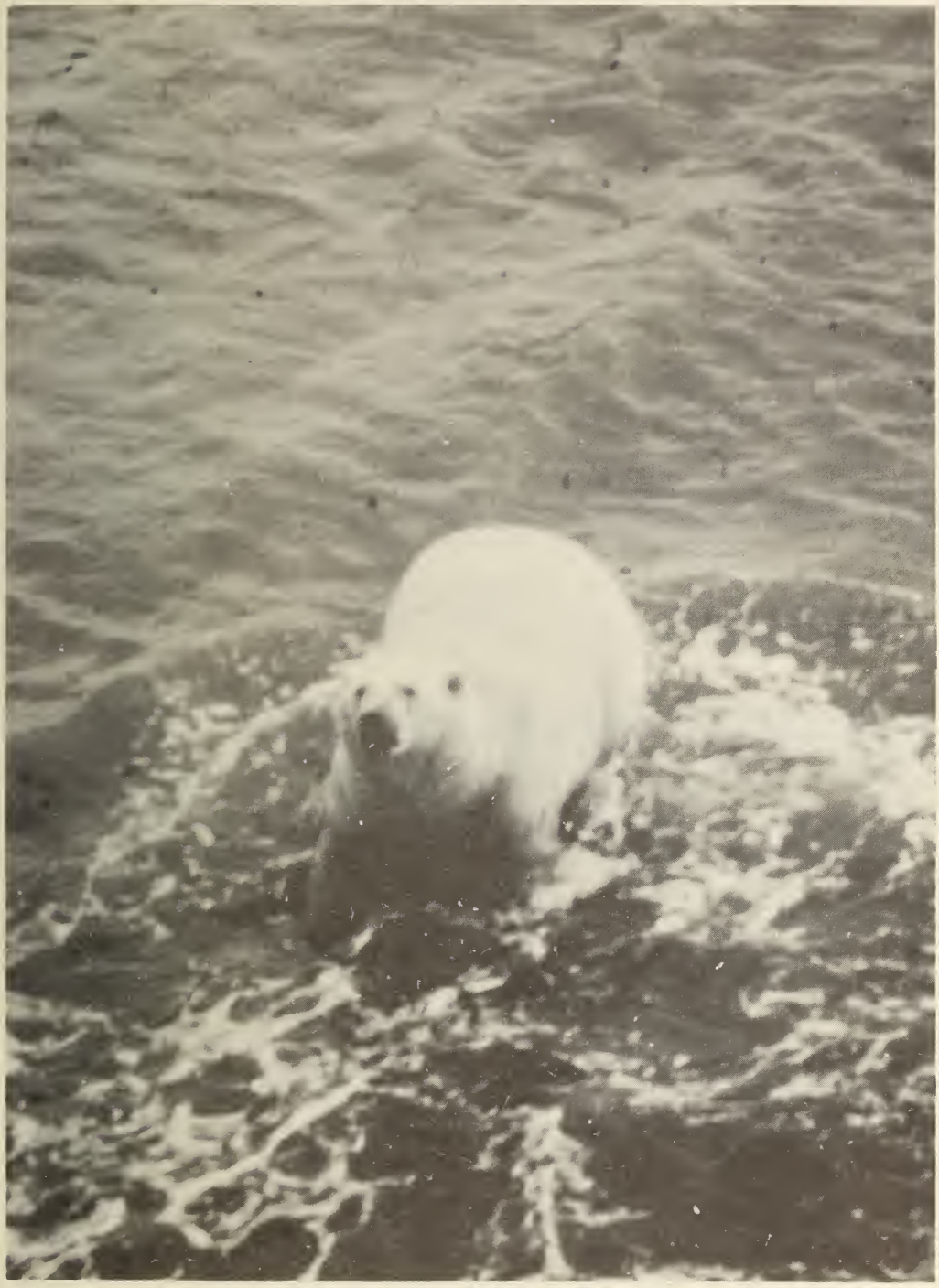

Plate 6. Most bears sought shelter in the sea when disturbed by aircraft. Even in shallow water, they appeared to lose their fear and behaved more aggressively. Bears have been found over one hundred miles from land or ice which is evidence of their swimming capabilities.

Plate 7. Three size classes of bears could be distinguished during the aerial surveys: large adults, yearlings and small females, and cubs. Solitary bears were invariably among the largest and were probably adult males.

Plate 8. During the summer months when bears are on shore, they appear to spend a great deal of their time resting. Their food at this time of the year is unknown, but it is suspected to be meagre; vegetation and carrion (seals and whales) may provide most of the diet.

Plate 9. In Ontario, cubs are born in dens in the spruce muskeg in the middle of winter. Some dens have been found by Indians over 100 miles from the sea. Cubs, which are born during December and January, are able to travel to the sea ice by March and April. During their first summer, females and their cubs usually remain apart from others on the coast.

Plate 10. Cubs remain with the mother throughout the winter following their birth. Most have left the mother by their second summer. Females attain maturity when three years old and are thought to breed every two years. The protective instincts of a female with cubs is clearly illustrated in the defensive attitude assumed by this animal. Unprovoked attacks on man are unknown in Ontario.

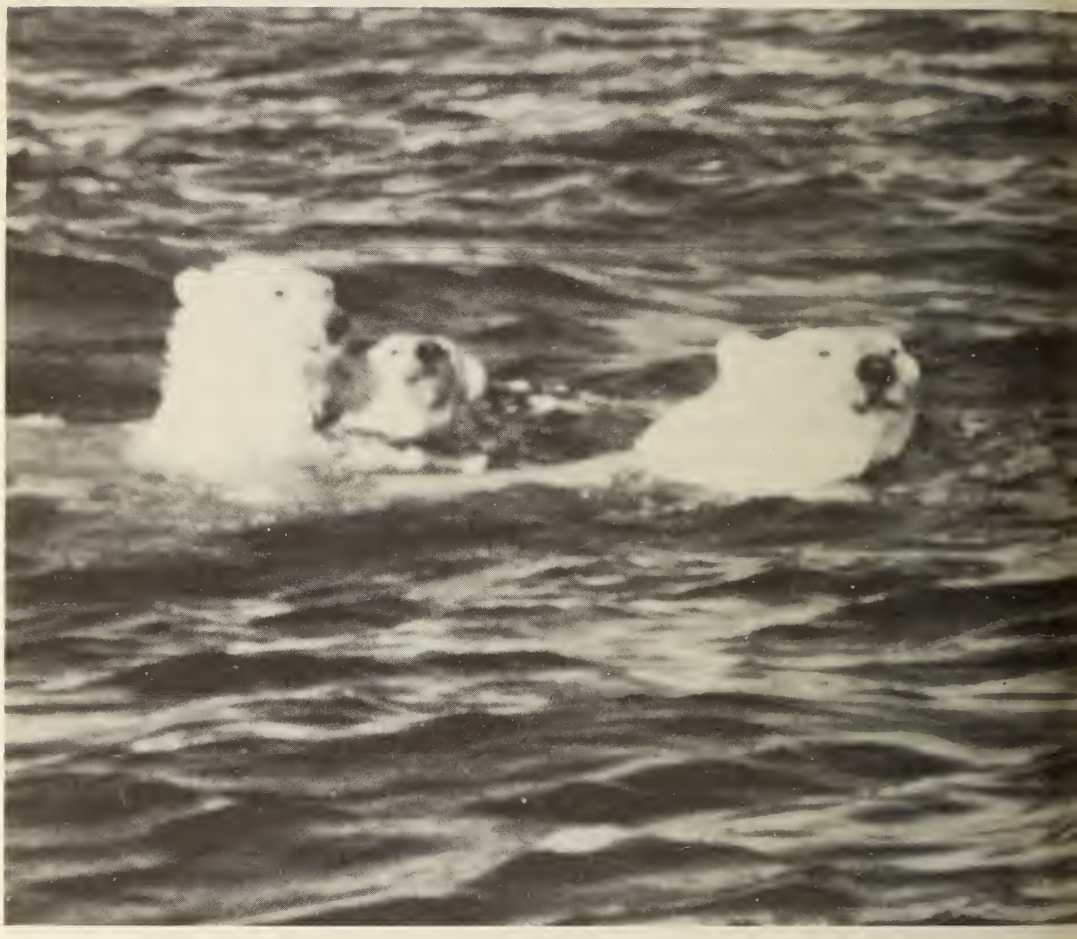

Plate 11. If harassed when in the sea, the mother may assist the cubs by allowing them to climb on her back as in this photo. This enables the entire group to flee at a much greater rate of speed.

Plate 12. Many eminent conservationists, today, are fearful that the polar bear may be faced with extinction. Truly, the present status of this species is epitomized by this group as they travel across the tundra to a destination that is unknown and a future that is uncertain.